

1005637 10604  
FO920T 228500T

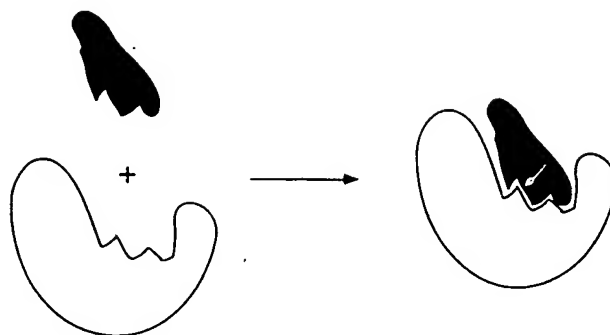


Figure 1a

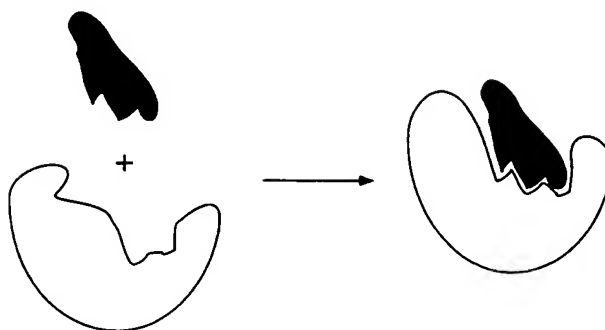


Figure 1b

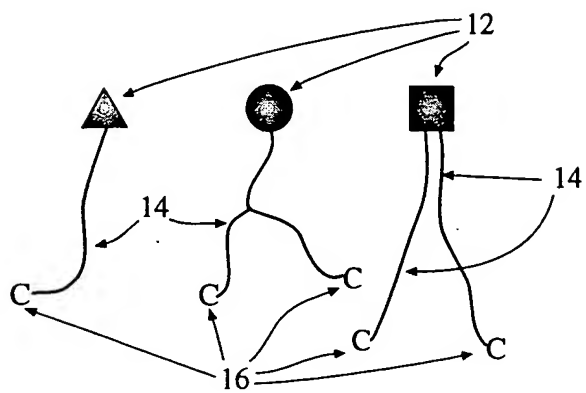


Figure 2(a)

4006597 402604

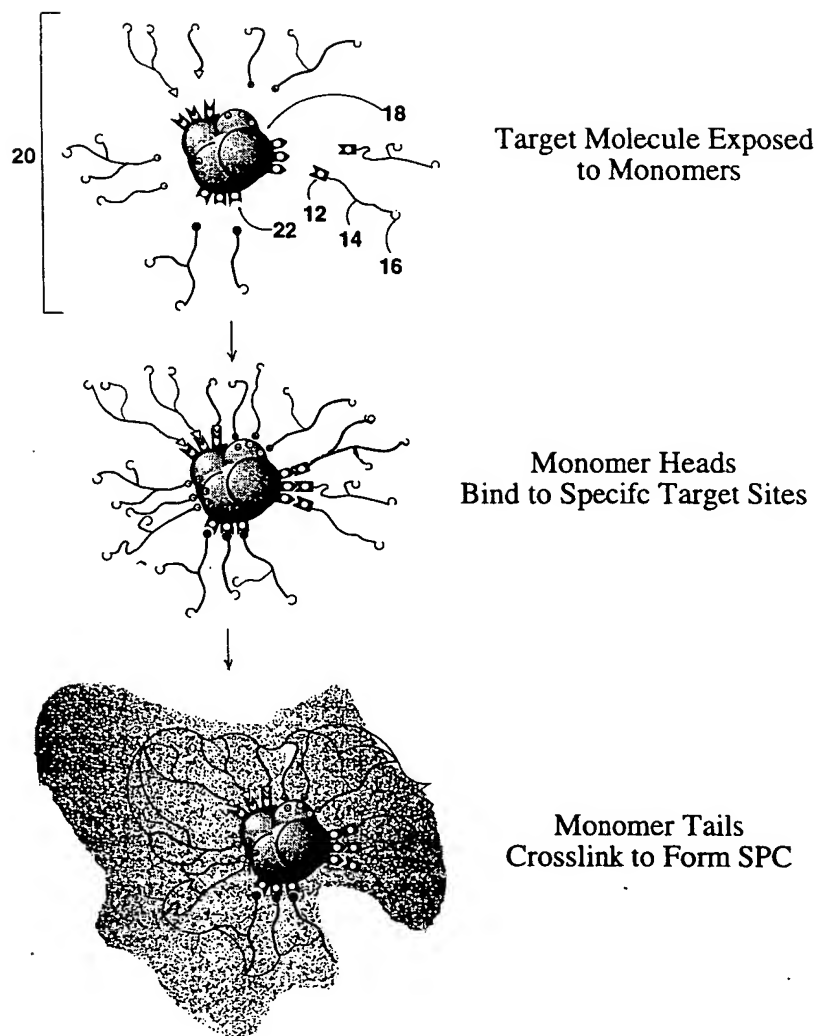
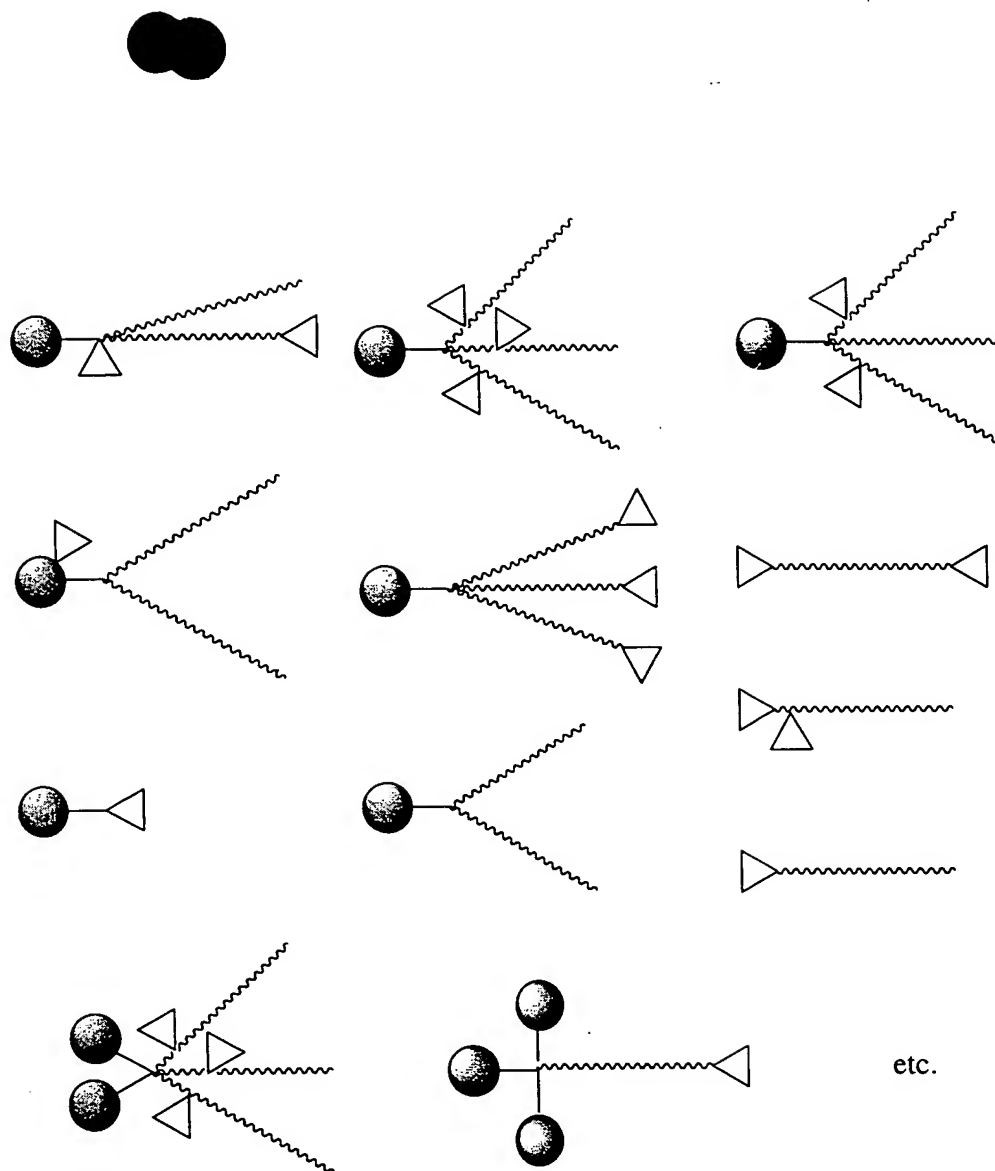


Figure 2b



# Key to Shapes



Head



Crosslinking  
moieties



Tail

Figure 2c

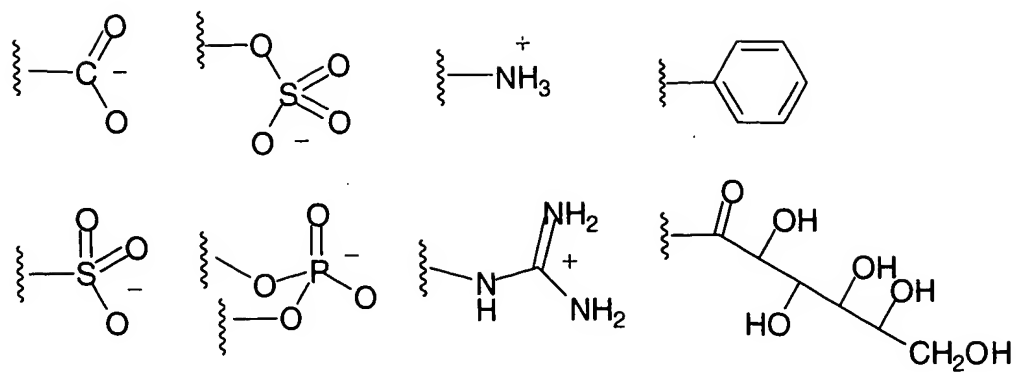


Figure 3

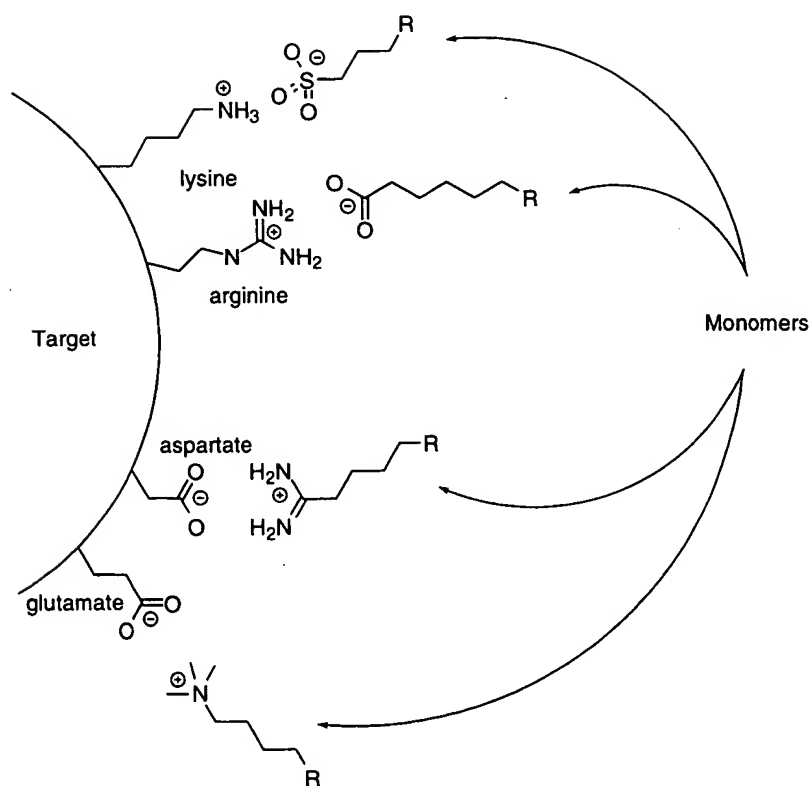


Figure 4

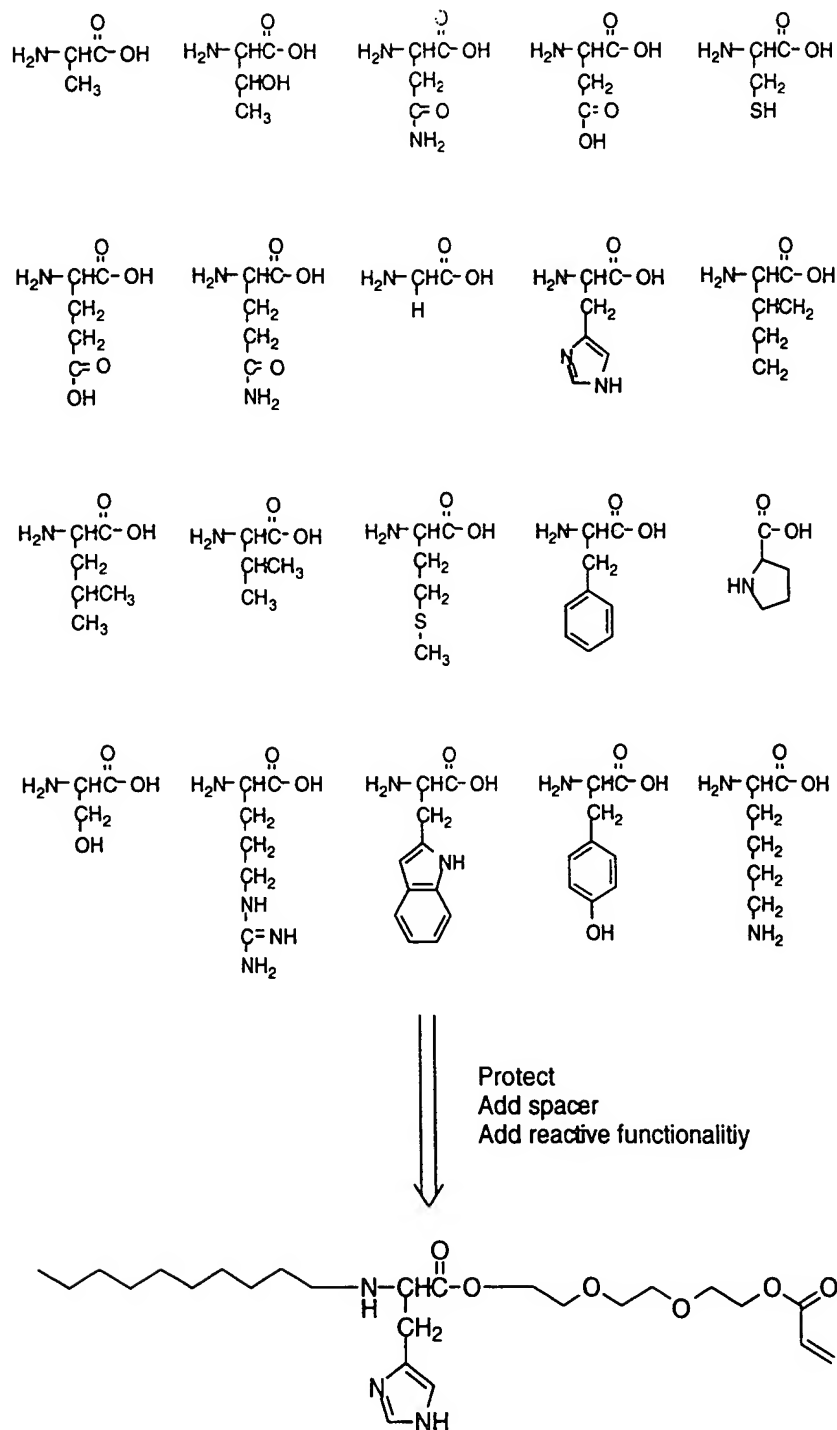
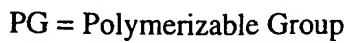
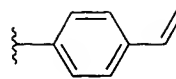
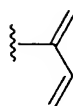
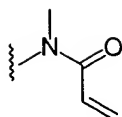
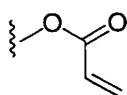


Figure 5

[illegible]

Figure 7





• Medium Polarity

• Low to No Polarity

Figure 8

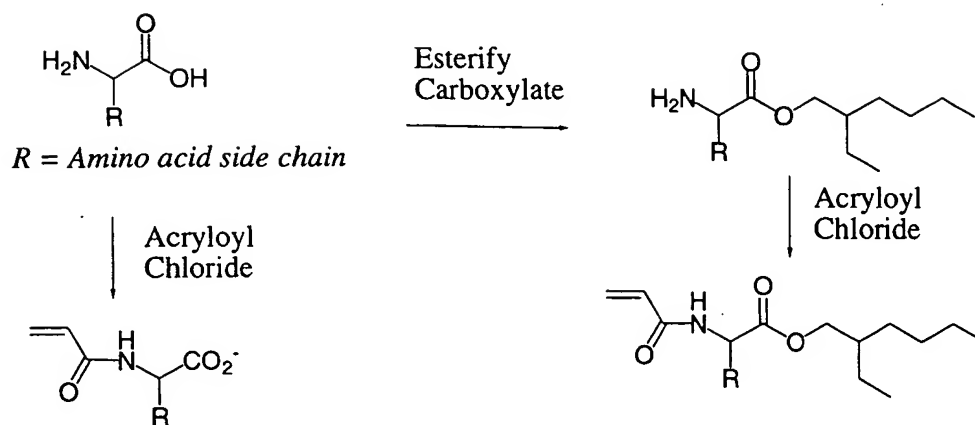
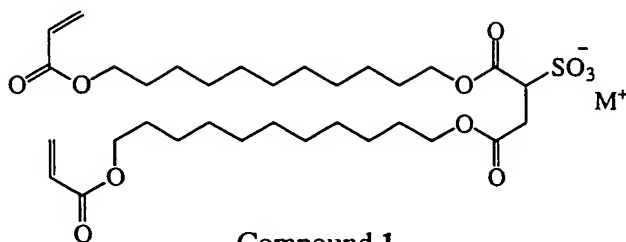
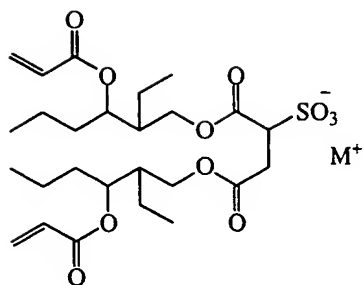


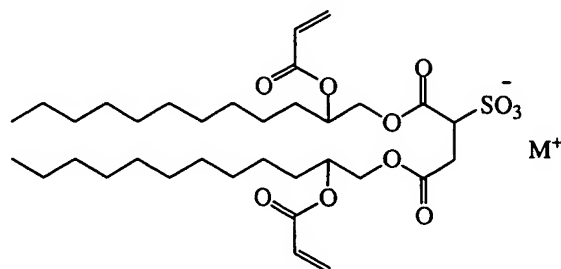
Figure 9



Compound 1



Compound 2



Compound 3

Figure 10

$$\begin{array}{c}
 \text{Maleic anhydride} + \text{HO}-(\text{CH}_2)_n-\text{OH} \longrightarrow \text{Bis-maleate intermediate} \xrightarrow[\text{or}]{\text{NaHSO}_3} \text{Sulfonated intermediate} \xrightarrow{\text{Acryloyl Chloride}} \text{Acrylate-terminated polymer} \\
 \text{1) } \text{CH}_3\text{C(O)SH, Benzoyl Peroxide} \\
 \text{2) } \text{HCOOH, H}_2\text{O}_2
 \end{array}$$

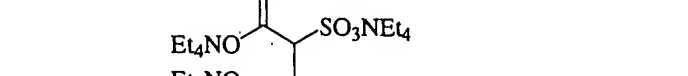


Figure 11c



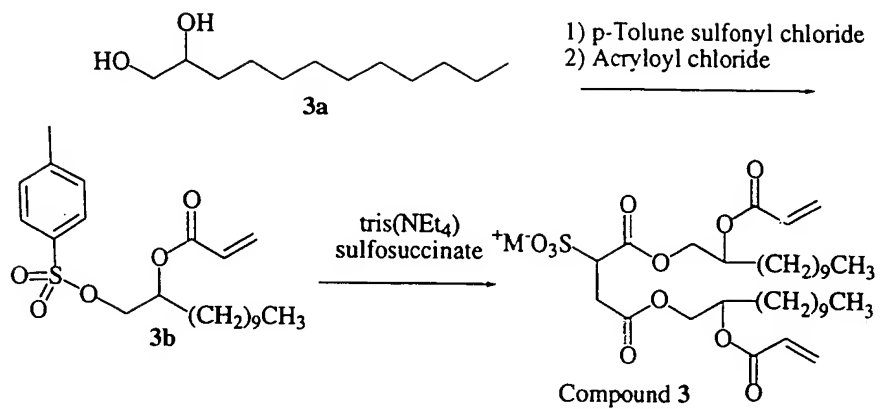


Figure 11d

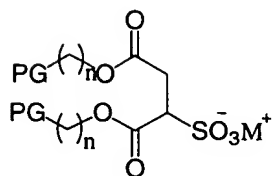


Figure 12

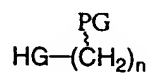


Figure 13

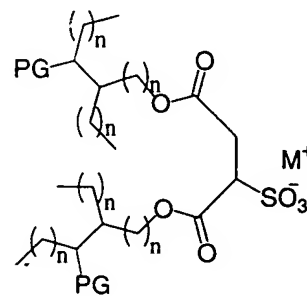


Figure 14

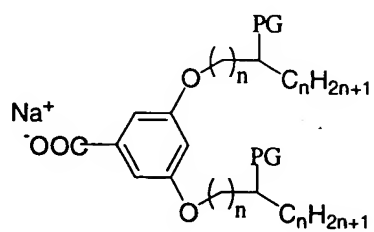


Figure 15

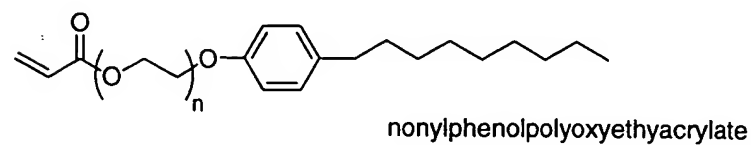
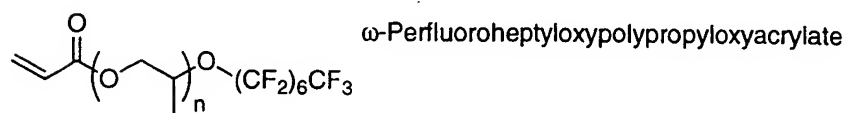
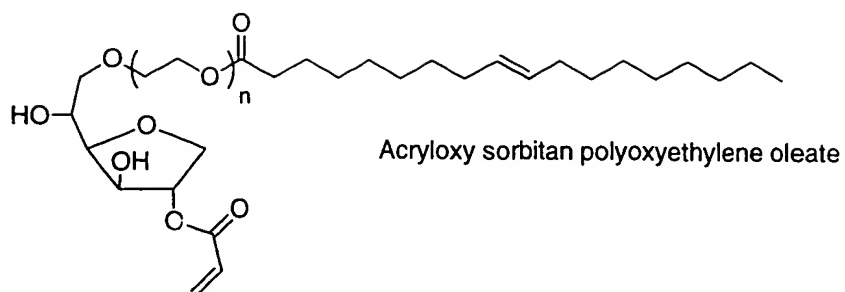


Figure 16

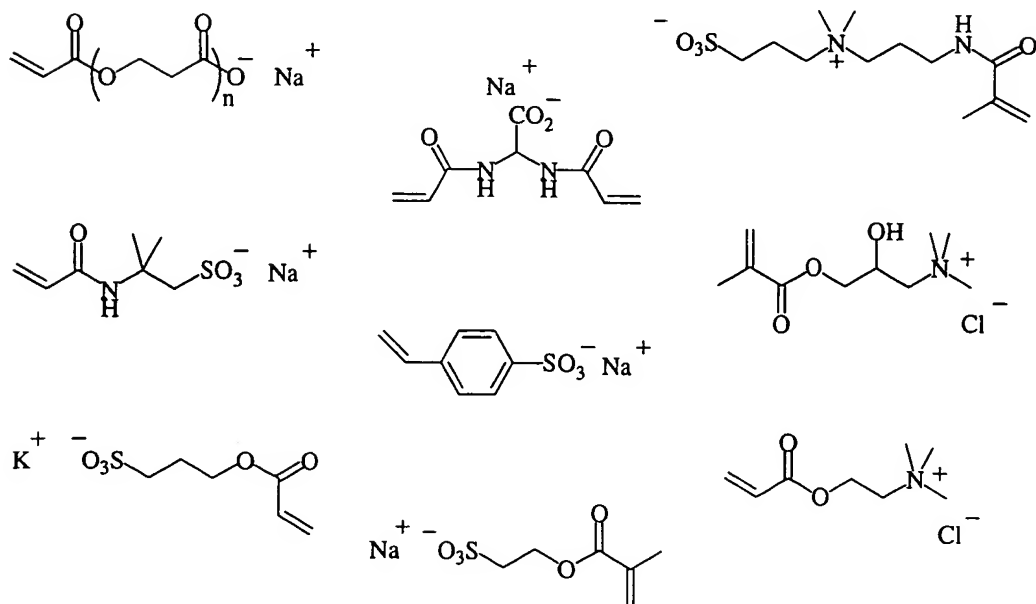
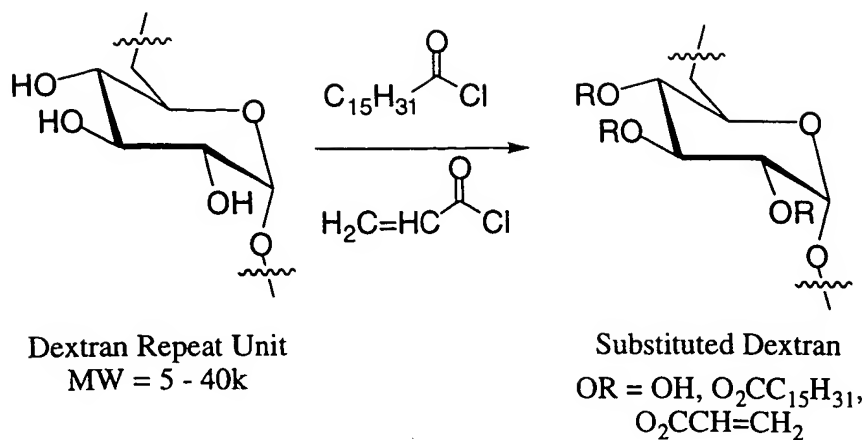
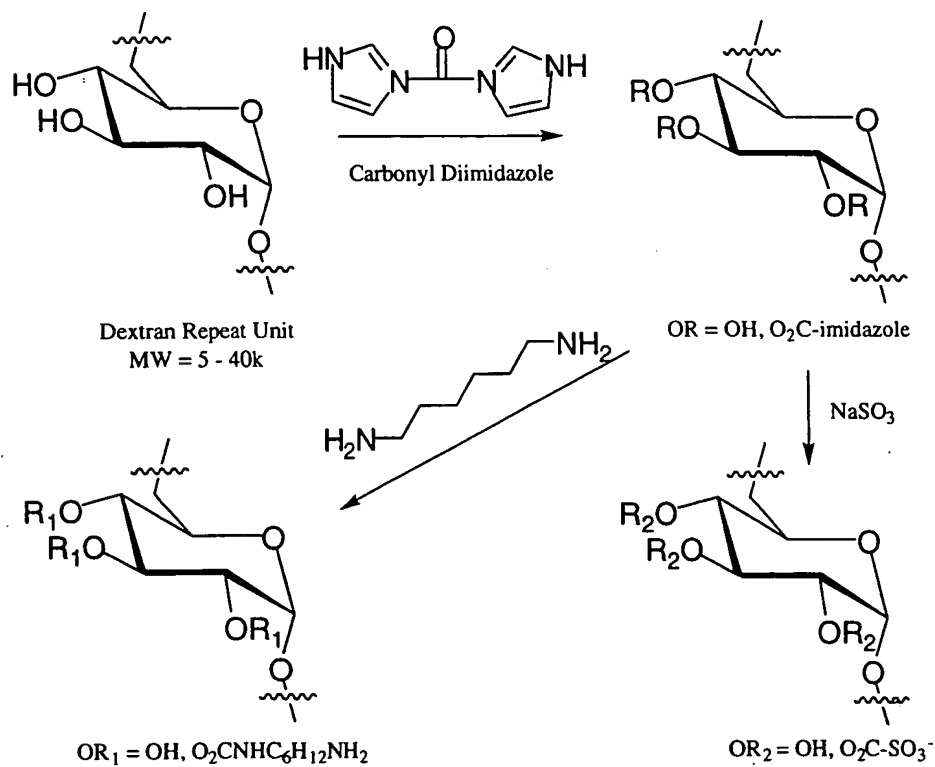


Figure 17

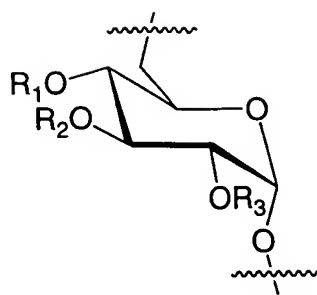


Carbohydrate based reactive surfactants



Addition of polar headgroups to polysaccharides

Figure 19c



Formula 6

Figure 19d

10055937 102674

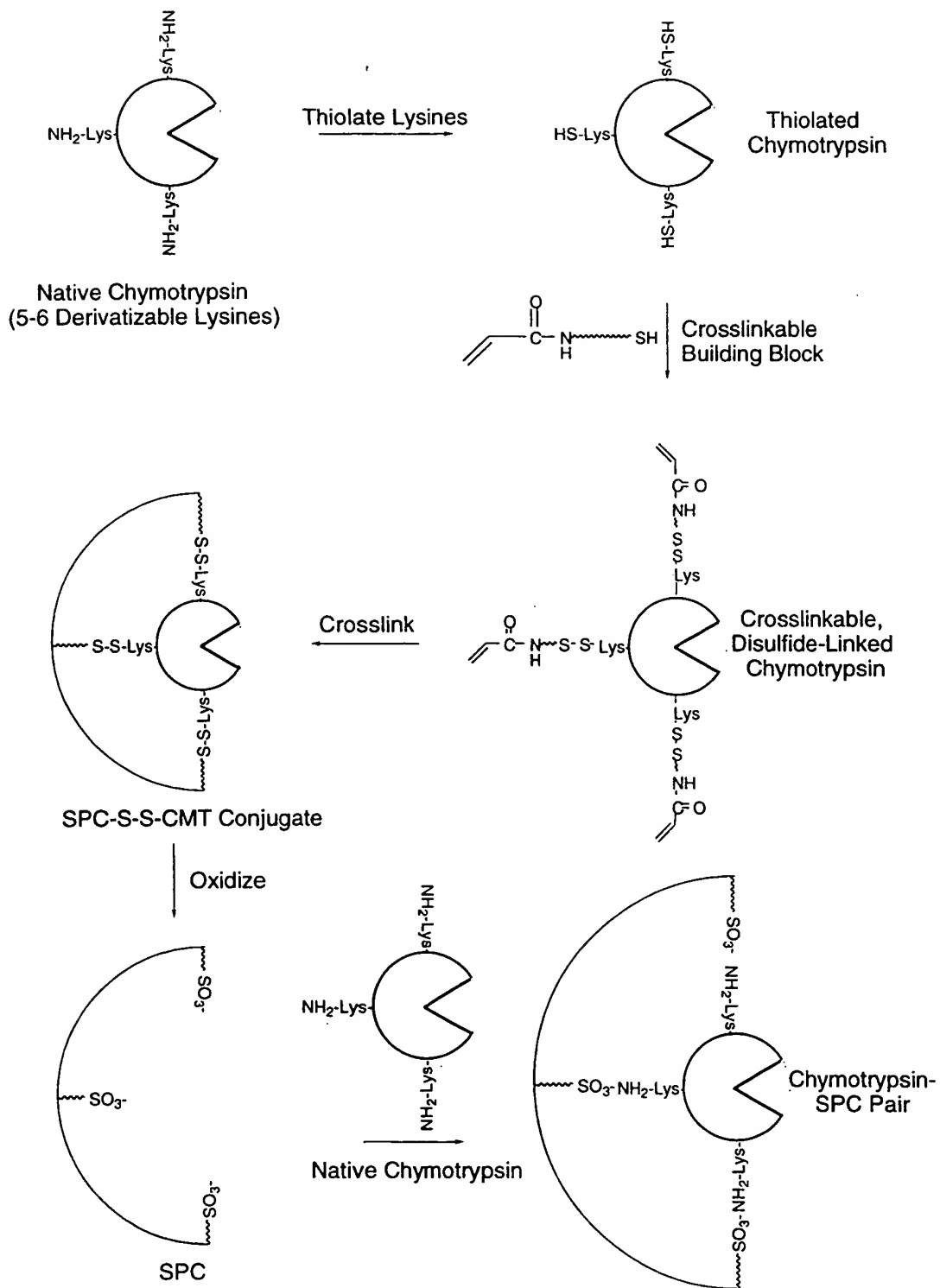


Figure 20a

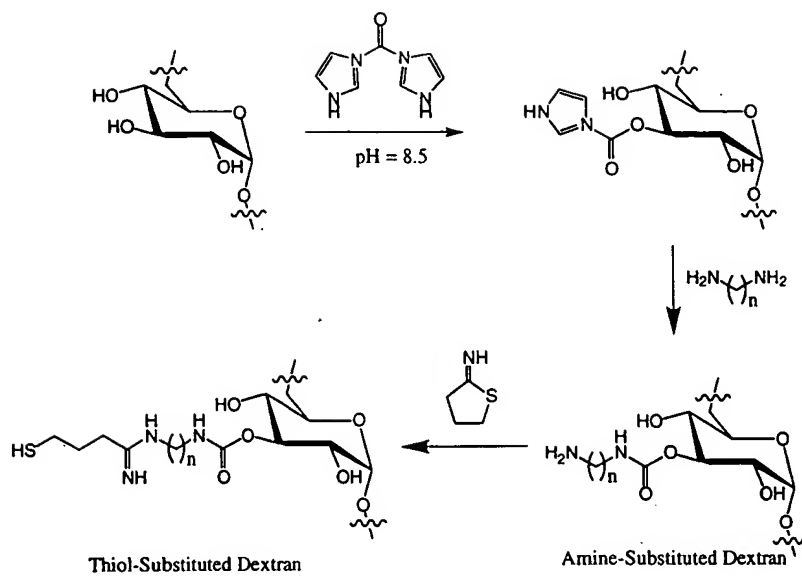


Figure 42

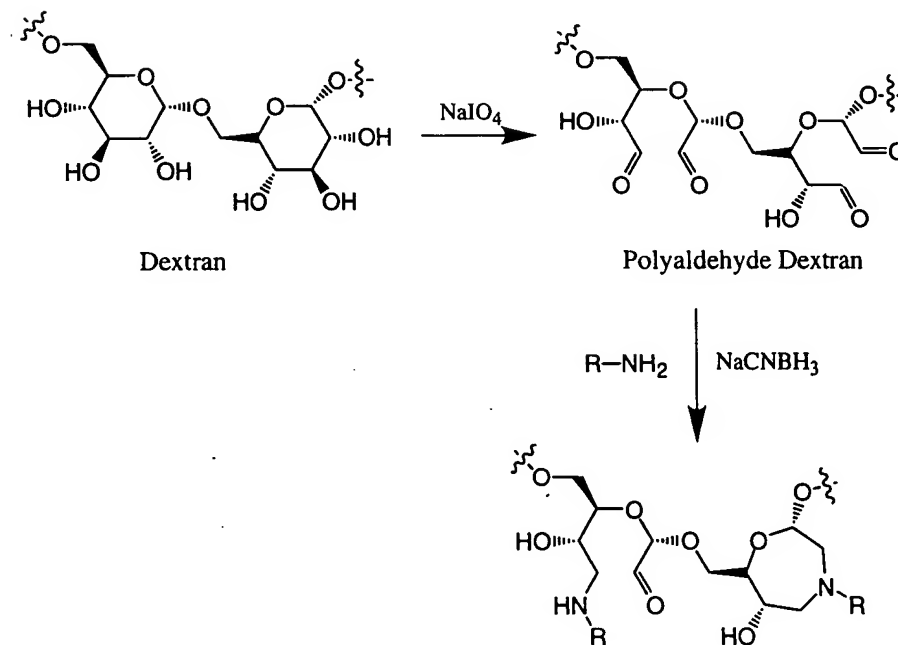


Figure 43

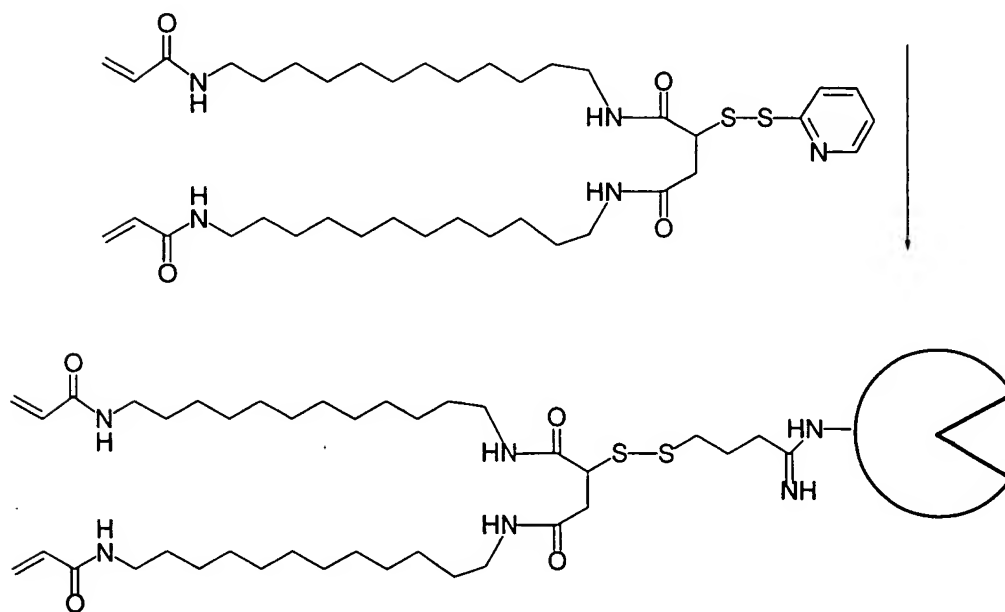
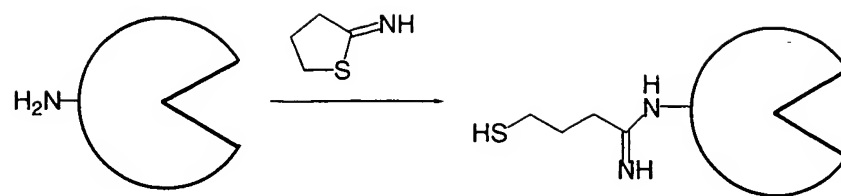


Figure 20c

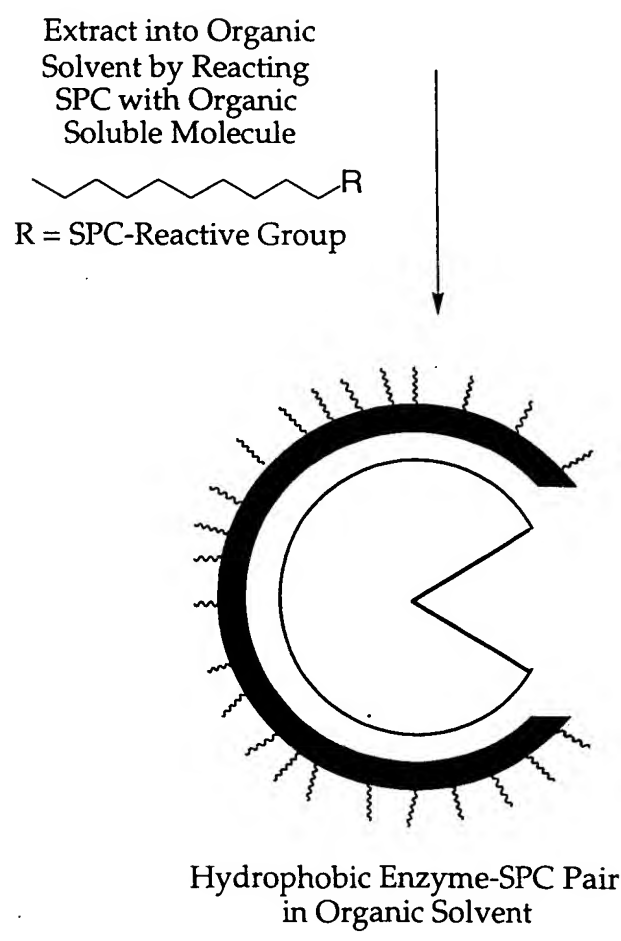
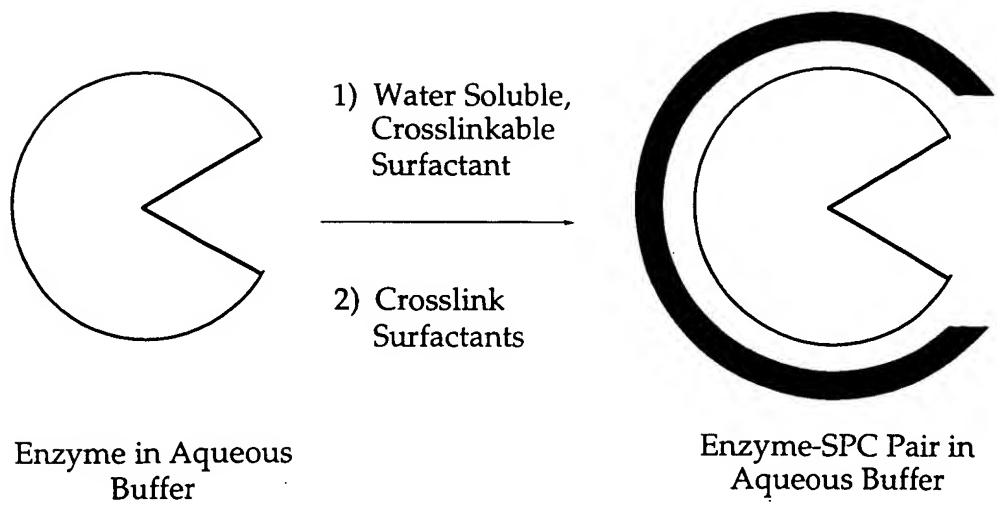


Figure 21

10055937 102604



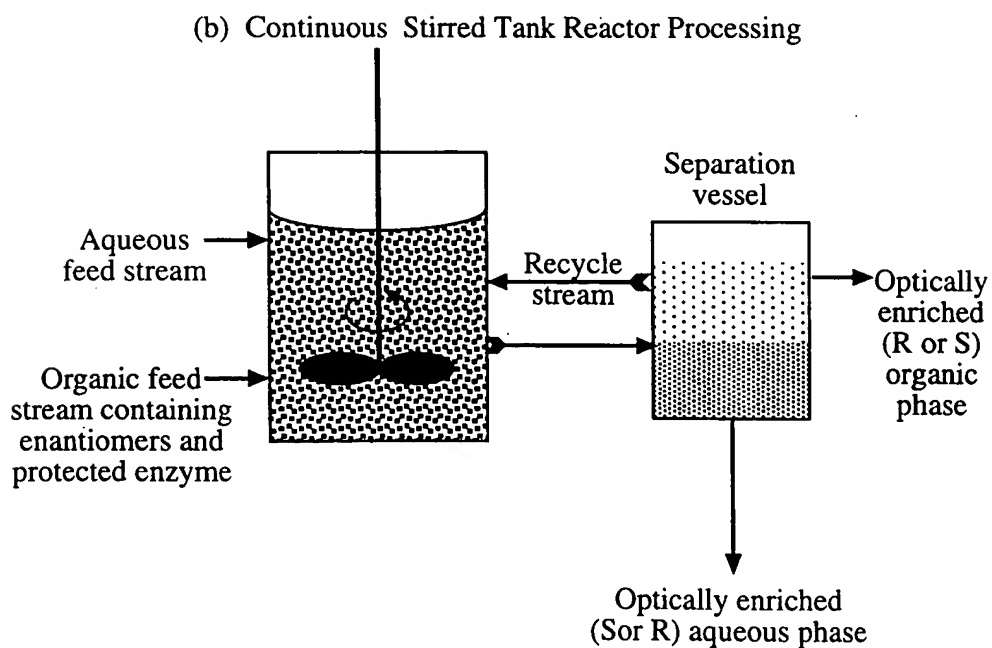
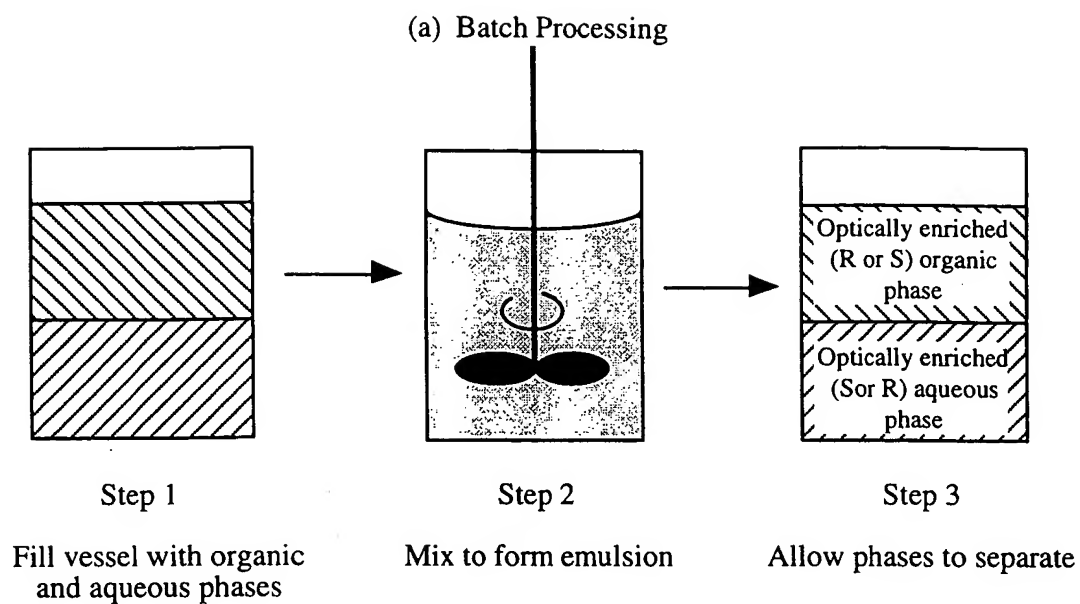


Figure 22

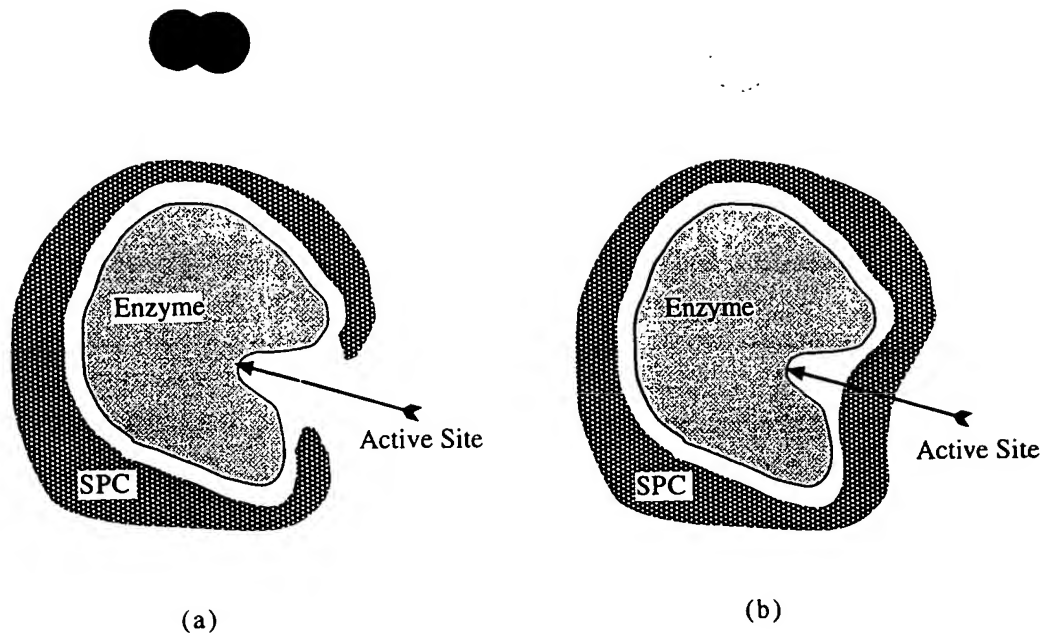


Figure 23

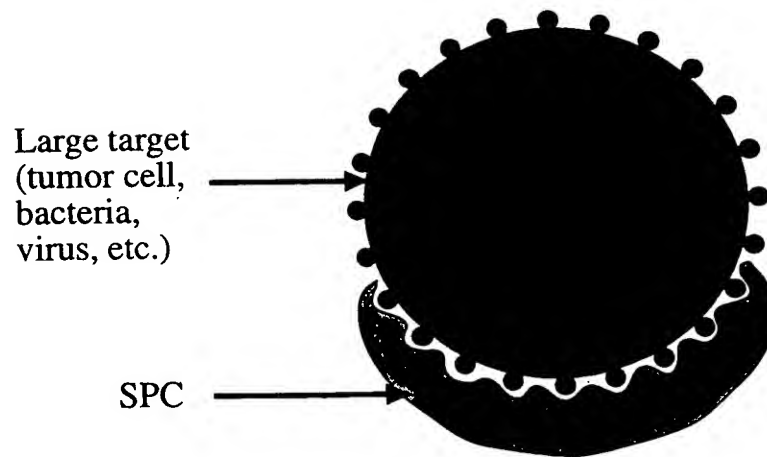


Figure 24

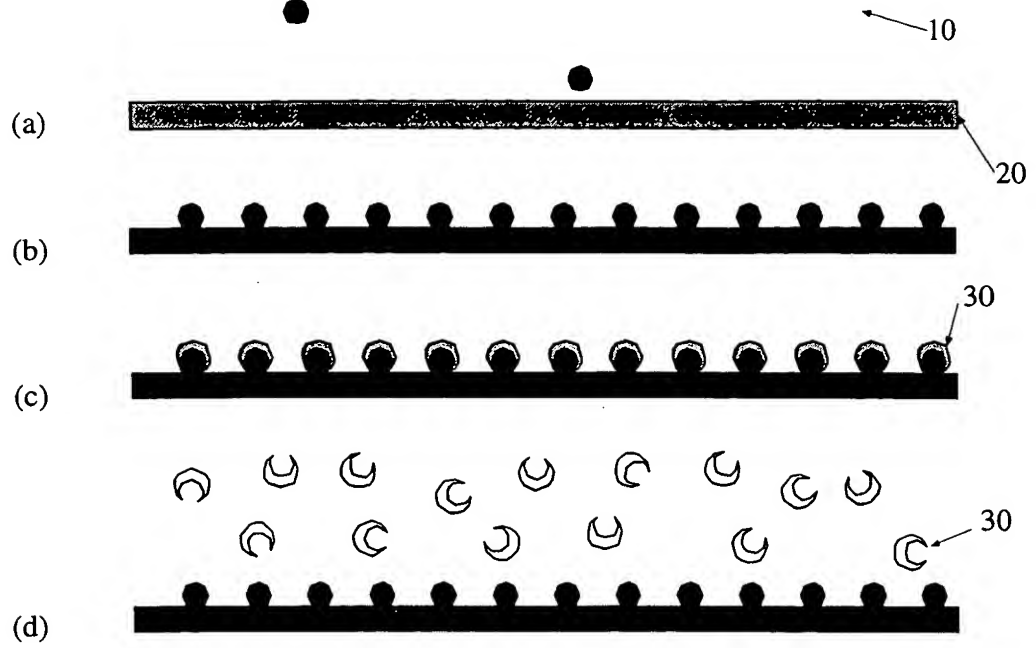


Figure 25

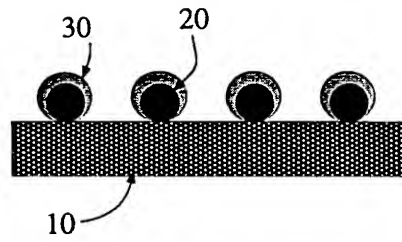


Figure 26

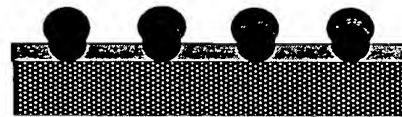


Figure 27

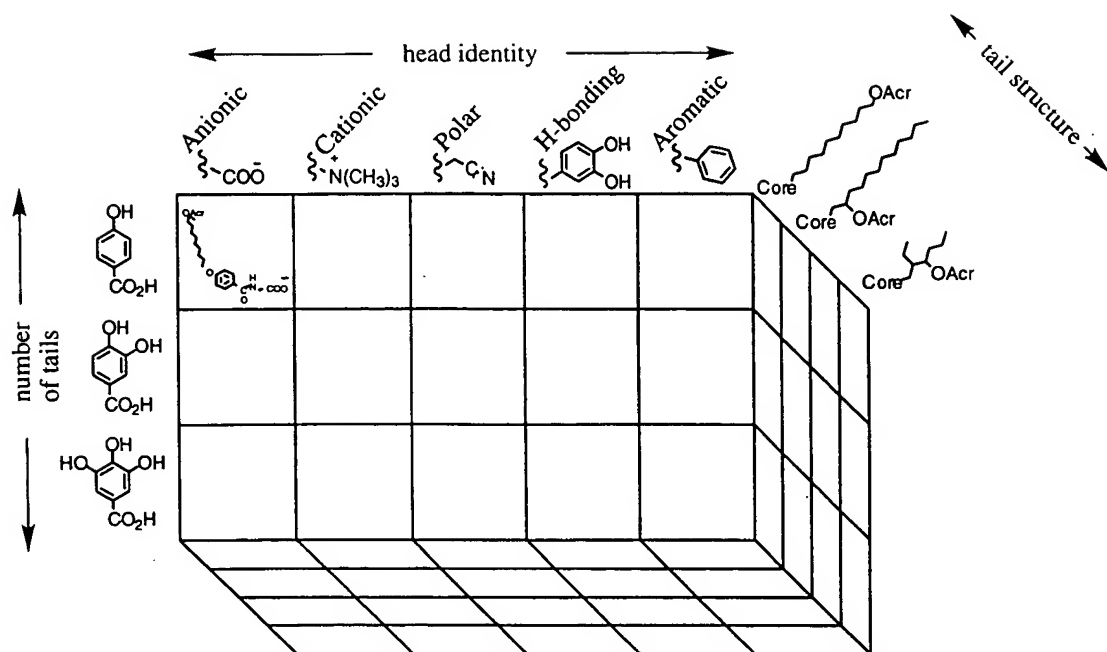


Figure 30

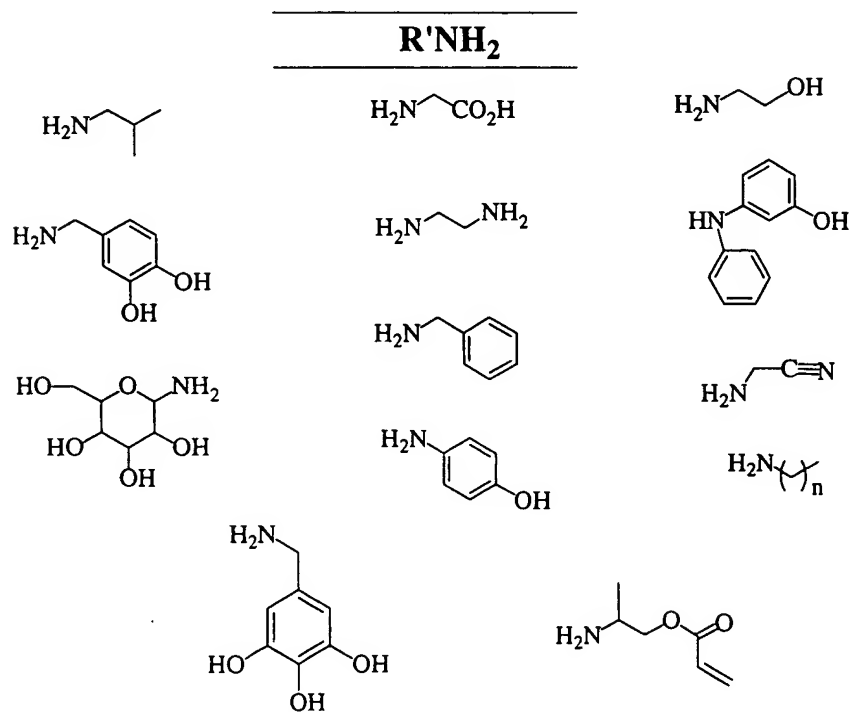
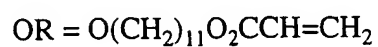
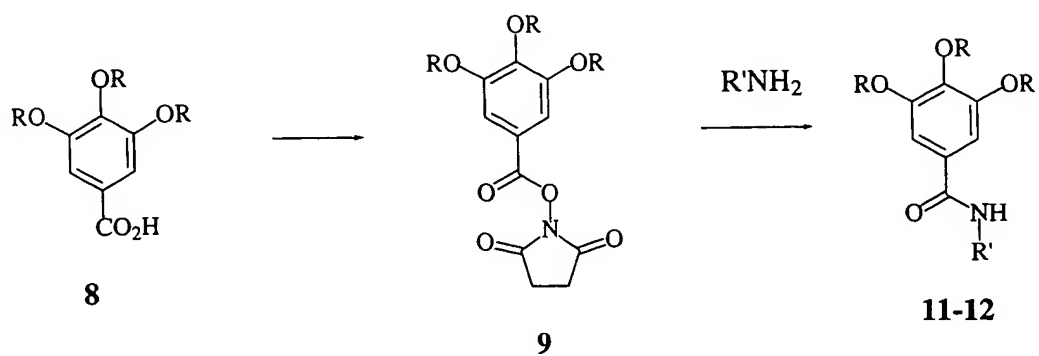


Figure 31



### Exemplary Compounds **11** and **12**

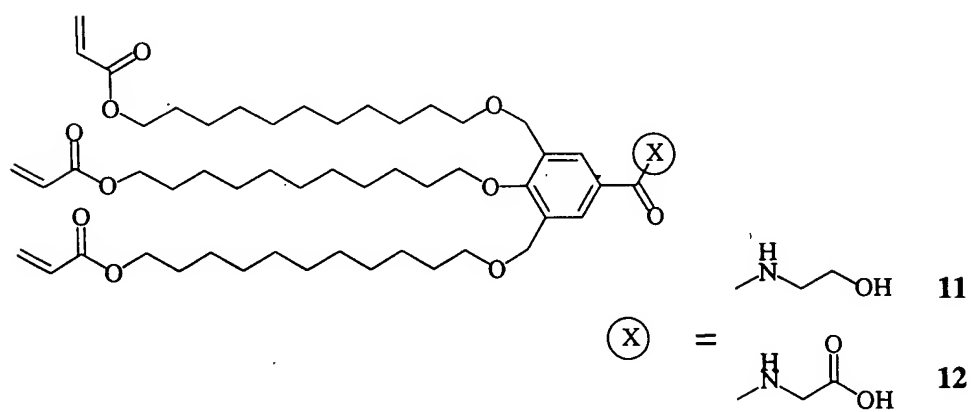
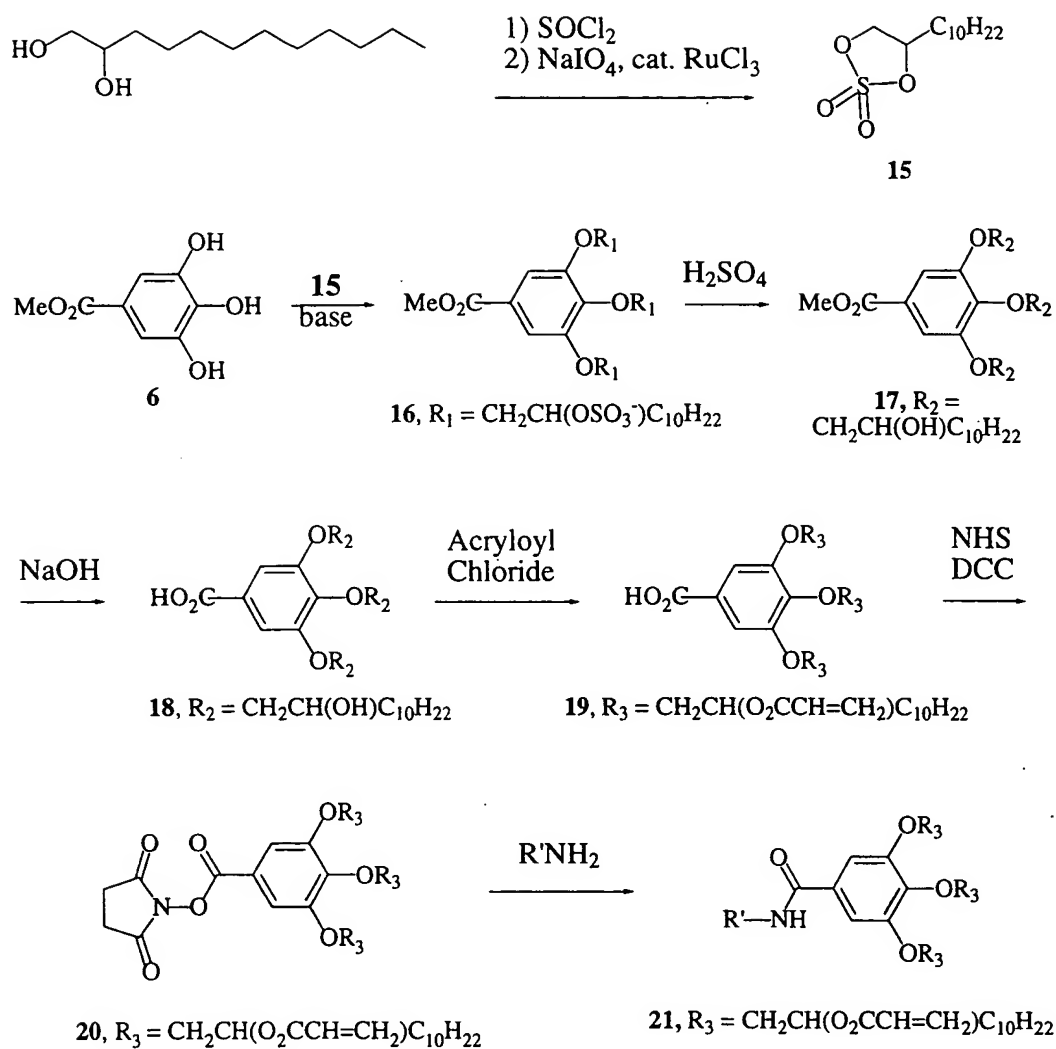
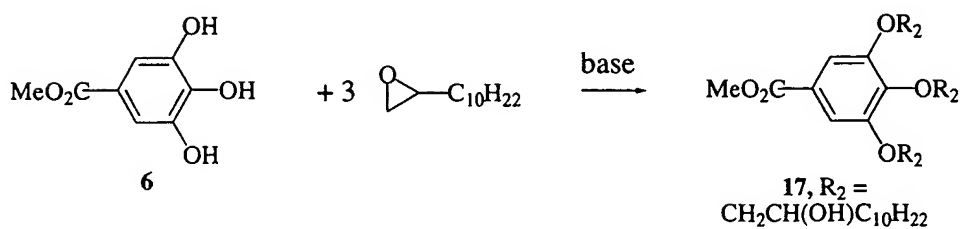


Figure 32



(a)



(b)

Figure 33

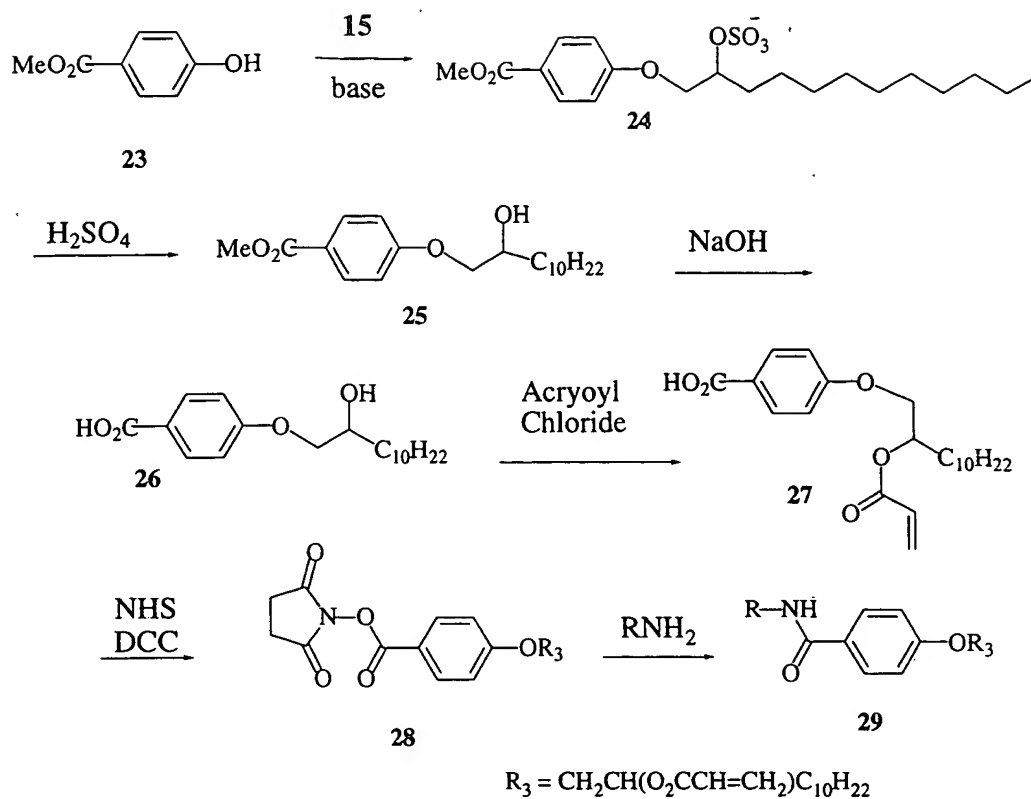


Figure 34

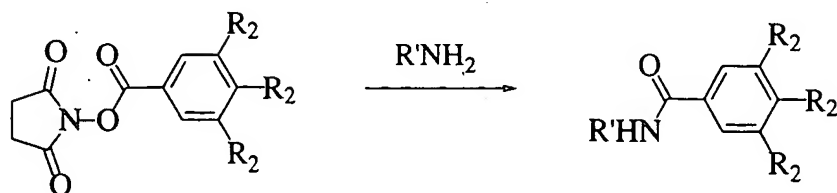
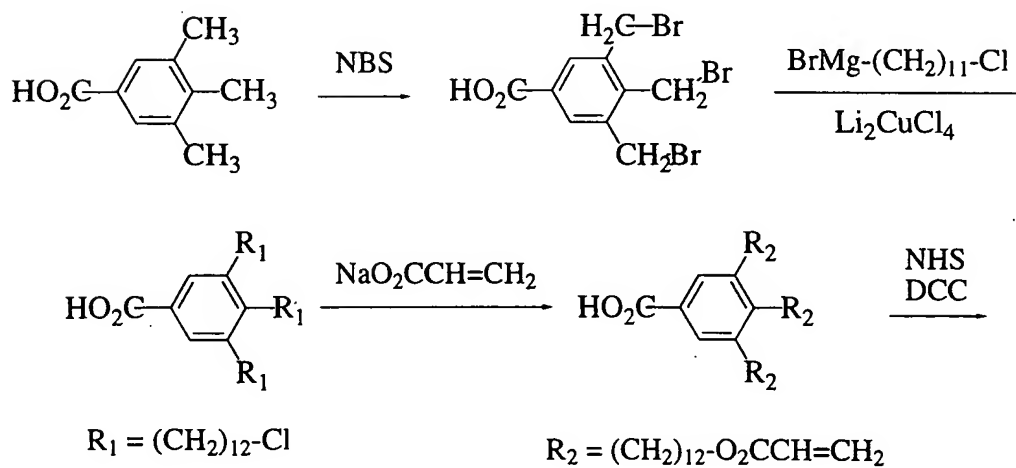


Figure 35

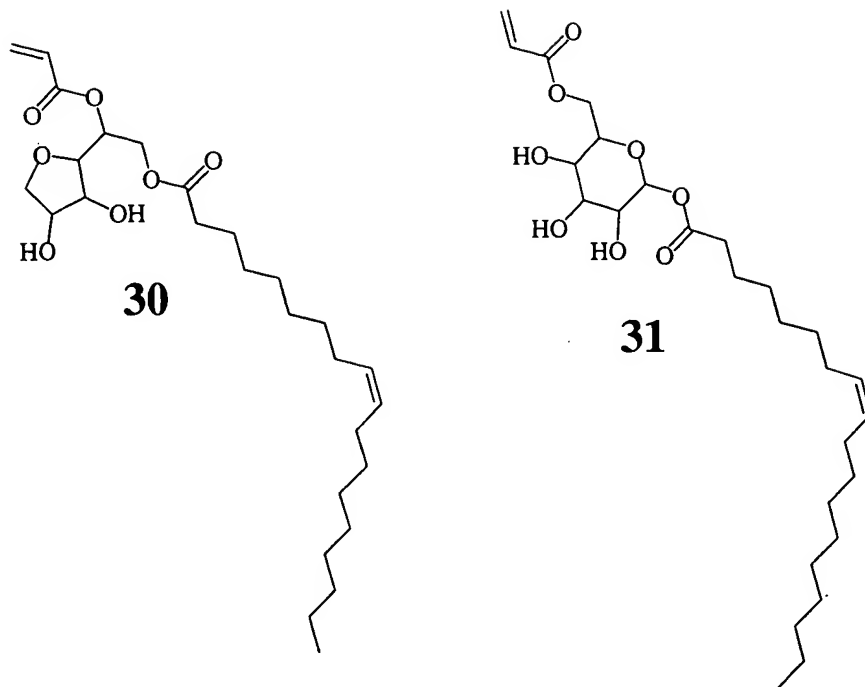


Figure 36

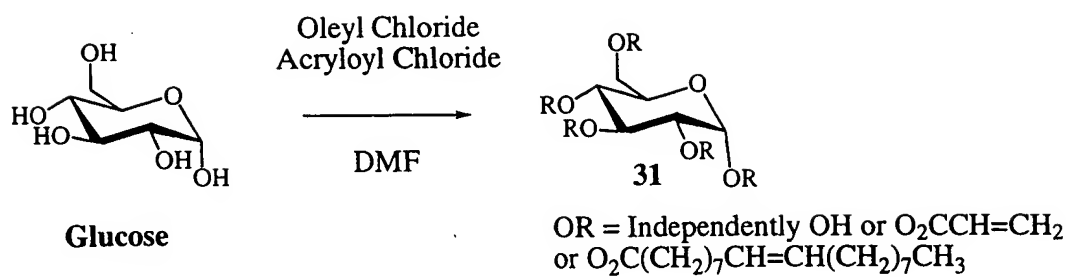


Figure 37



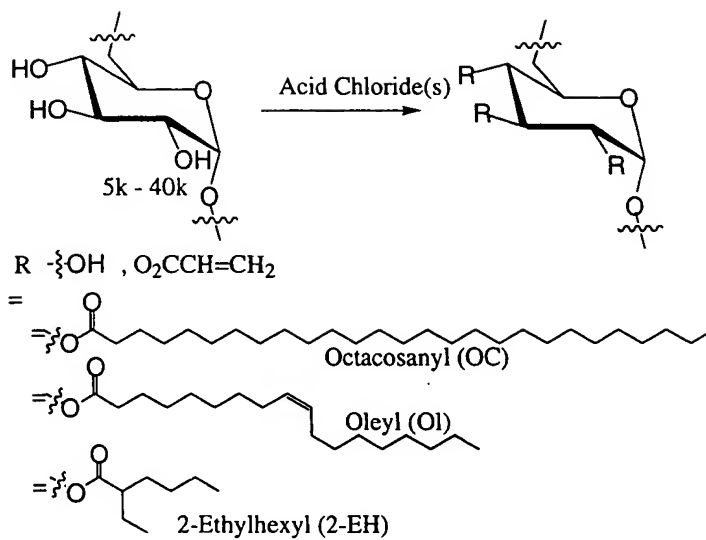


Figure 38

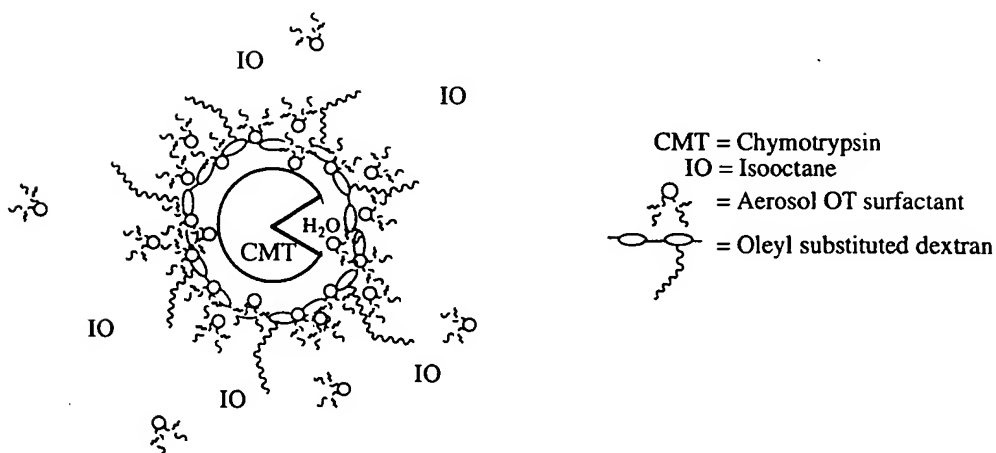
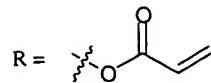
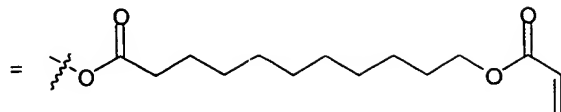


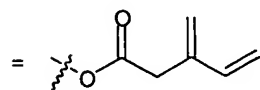
Figure 39



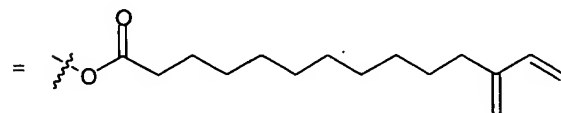
Acrylate Tail (Ac)



Acrylate Hydrophobic Tail (AcH)



Butadiene Tail (Bd)



Butadiene Hydrophobic Tail (BdH)

Figure 40